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Senior High School

Curriculum Guide

Vocational Series

FORESTRY 12 - 22 - 32

(Interim Edition, September, 1966)

Province of Alberta

Department of Education

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COURSE CREDIT VALUES

Forestry 12	5 credits
Forestry 22	15 credits
Forestry 32	15 or 20 credits

One credit corresponds to a minimum of 40 minutes of instruction time per week.

FOREWARD

Alberta has a large forest-producing area where the rate of growth of merchantable species compares favourably with the rate for the same species in parts of Eastern Canada. More and more we are coming to the recognition of this valuable asset.

The Eastern Rockies Forest Conservation Board, a joint federal-provincial body, was set up to administer the Rocky Mountain Forest Reserve. The object of management is to protect and manage for optimum yield the water of the Saskatchewan River and its tributaries.

There are two other major divisions of land in Alberta. In one, new land settlement is permitted for Agriculture. The other comprises areas which have been reserved from settlement. This latter portion totals approximately 142,000 square miles and the majority of the commercial forests of the province are located here.

In order to harvest forest products successfully and economically and at the same time sustain and increase our forests for water conservation, wildlife and recreational purposes, it is essential that these activities are carried on by well trained knowledgeable and responsible people. Alberta's forest industries and related fields provide many varied and interesting occupational opportunities, particularly for those who wish to work in the outdoors.

GENERAL OBJECTIVES OF THE PROGRAM

The purpose of this program is:

- to prepare youngsters for life
- to provide a realistic understanding of and respect for work
- to aid young people in finding jobs through acquiring skills and through determining their aptitudes and limitations
- to develop in students habits useful when employed, such as punctuality, regularity, ability to work with others and willingness to take orders
- to help students gain self-reliance and self-confidence
- to impart to the student knowledge of the role that Forestry plays in Alberta today and the opportunities that exist in this rapidly expanding field
- to equip the student with sufficient skill and knowledge such that he will be highly employable in the forestry field
- to provide the student with sufficient background in this area such that on entering the forestry field, he will be able to advance at an accelerated rate on the basis of his proven ability on the job.

GENERAL INFORMATION

Course Credit Values:

Forestry 12 - 5 credits

Forestry 22 - 15 credits

Forestry 32 - 15 or 20 credits

Safety Program

Particular attention must be given to the safety measures required in the industry, adequate guards (mill), cleanliness of mill maintained at a high standard, students properly clothed for their work, etc.

A good safety program features the following devices: regular, consistent and thorough instruction; constant vigilance and checking by the instructor; safety posters; adequate first aid equipment; adequate working space about machines; routine report on accidents, however minor; machines and tools in approved working condition; safety-conscious group of students and instructor.

Instructor's Records

Instructor should keep accurate records of:

a. student enrolment and attendance
b. student accounts
c. student work activity
d. theory covered
e. tests given
f. student achievement
g. up to date inventory of all equipment

Students' Records

Students should develop and maintain a neat and accurate record of:

a. theory that is given
b. daily shop activities (time cards)

FORESTRY 12

Objectives of Forestry 12:

- to provide exploratory experiences in the field of forestry
- to acquaint students with the opportunities for employment in the field of forestry
- to provide the necessary background for Forestry 22 and Forestry 32

INTRODUCTION TO FORESTRY

40 hours

This unit is designed to introduce the students to the field of forestry, and to acquaint them with the opportunities for employment.

Importance of Forestry in Canada - This unit should treat generally of the importance of Forestry as Canada's 3rd largest primary industry.

A. The importance of the forest industry to Canada and its relationship to the secondary industries of Canada

B. In Canada, there are a large number of wood-using industries of various types.

References: Our Natural Resources. Queen's Printer, Ottawa.

Canada - A Forest Nation. Department of Forestry.

Suggested Activities:

1. Show on a map of Canada the distribution of the commercial timber types and the location of large industrial centres where wood products are produced.

2. Report on the importance of each province as a timber producer, consumer or wood manufacturing area.

3. Make a list of the wood using industries in Canada and indicate their importance.

4. Do the same as above to stress the importance of Forestry in Alberta.

Various Aspects of Forestry Practice:

- Forest Inventory and Surveys: Calculates the volume of the forests of the Province by species and age. Measurement of timber stands enables foresters to calculate volume of existing stands and to predict volume of future stands.

- Forest Protection: Protects the forest against fire, insects, disease.

- Forest Management: Based on profit, protection, service to community and perpetuity of the forestry program. Regeneration. Timber growth. Cruising. Timber sale. Harvesting.

- Forest Harvesting: Cutting of trees for the production of lumber, plywood, posts and poles, pulpwood.

- Forest Recreation: Campsites, parks. Wildlife: Management of Fish and Game

- Functions of Alberta Department of Lands and Forests: Forest Surveys, Forest Protection, Forest Management, Provincial Parks, Fish and Game.

- Function of Federal Department of Forestry Research: Forest Protection

- Forest Occupations: Industry: Logging - Faller, bucker, skidder, woods foreman, pulpwood scaler

  Sawmilling - Sawyer, edgerman, trimsaw, fork left operator, green chain, millwright, camp clerk, lumber tallyman, log scaler.

  Truckdriver.

  Government: Look out Towerman, Fire Boss, Radio Operator, Standby crew foreman, Tree Marker, Cruiser, Asst. Party Chief, Reforestation Foreman, Construction Crew Foreman.

Note the relationship between the forest and people from early times to the present and indicate the nature of the modern concept of the terms "forest" and "forestry". Emphasize that purpose of resource management is to benefit people. Students' understanding of concepts on which resource management is based:

a. Influence of the forests upon the progress of and welfare of mankind
b. Values of a forest. Forests of the future.
c. Forests vary diversely in kinds and structure.
d. Branches of forestry have developed as a result of the widening scope of forest influence and activities.

References: "Resources for Tomorrow" Forestry Lessons Part II
"Careers in Forestry", Alberta Department of Lands and Forests
"The Forest Ranger", Alberta Department of Lands and Forests
"The Rocky Mountain Forest Reserve", Department of Lands and Forests
"Forest, Land and Wildlife", Department of Lands and Forests

Suggested Activities:

- Excursion to forest to point out the structure and dynamic nature
- Report on nature of various branches of forestry
- List main uses of wood in general
- List properties of wood in general
- List values of a forest besides the value inherit in wood itself

BOTANY

80 hours

This unit deals mainly with the physiology, botany, biology and ecology of trees and forests. Fundamentals of botany as applied to Forestry:

- Plant anatomy: The major parts of the tree
- Plant morphology: The functions of the parts of the tree
- Plant physiology: A tree carries on certain life processes - photosynthesis, digestion and assimilation, respiration, transpiration and growth
- Reproduction in trees: Pollination, fertilization, seed distribution and germination
- Tree growth: Establishment of the seedling. Life cycle of a tree.
- The wood of a tree is the result of activity of the cambium layer and consists of cells of various types according to their function.
- Introduction to plant ecology: Factors of environment affect the life of plants and determine their occurrence to a large extent.
- Forest tree identification: Conifers and hardwoods.
- Forest associations in Alberta: Trees may also be classified according to age, size, position in the stand, tolerance and other growth characteristics.
- Properties of common softwood and hardwood species
- Log and wood identification: Characteristics and properties of common commercial woods.

References: The Incredible Tree, by G. H. Lash
Forestry Lessons; Part I
Forest Flora of Canada
Western White Spruce: Its properties, uses and grades
Botany & The Ranger: A.F.S.
Native Trees of Canada: Department of Northern Affiars and Natural Resources
Canadian Woods, Their Properties and Uses: Forestry Branch, Department of Research and Development, Ottawa, Canada.

Suggested Activities:

1. Conduct a tour of school forest to point out tolerance, dominance, growth habits of species, natural thinning, possibility of pruning and thinning practices, selective cutting methods.

2. Collect specimens of trees and shrubs and indicate their position in the system of plant classification. Have them identified.

3. Show slides to indicate the cell structure of softwoods and hardwoods.

4. Show the film: "Conserve our Heritage".

Mapping and Mensuration

This unit is to introduce the students to the understanding and proper handling of maps used in forestry work as well as in the more common field measurements done in forestry.

- Dominion Land Survey
- Introduction to planimetric maps. Map scales.
- Introduction to Timber Type maps: different types and scale of maps used in Forestry
- Map reading: Forestry symbols
- Fundamental principles of surveying: Traversing: Open and Closed Traverse: Theory of surveying with compass and tape. Duties of head and rear chainman. Magnetic declination. Local magnetic attraction. The hand compass. Measurement of distance with steel tape. 100 ft. tape, chain tape. Units of measurement: Feet, links, chains, Measurement of distance by pacing.
- Measurement of the individual tree: Diameter, height, age and growth.
- Abney level, diameter tape, increment borer: Adjustment and care of these instruments. Symptoms and correction of maladjusted instruments.
- Measurement of logs and lumber: Units of measurement and their application in determining the volume in f.b.m., cu. ft., cords or by the piece.
- The scale stick.

References: Leupold compass Instructions and Guide
Silva compass Instruction Manual
Leupold Abney Level Handbook
Elem. Plane Surveying. A.F.S.
A.F.S. Map Index. Department of Lands and Forests, Edmonton

Suggested Activities:

- Bush travel with map and hand compass
- Compass and Chain Traverse: Simple traverse
- Identifying timber types in the field onto maps
- Use of maps to locate one self
- Measurement of diameter, height, age and growth of trees. Emphasis on techniques of making measurements and tallying.
- Adjustment and care of instruments
- Log scaling
- Lumber tallying.

FORESTRY 22

Having reviewed the basic concepts taken in Forestry 12, the Forestry 22 course shall present a further study of basic theory and supporting activities. It is intended that about half the lab. time be given to field activities on use of instruments, etc., and the other half on "office" preparation, compilation and reports.

Forestry 22 is intended to be the "meat" of the course in Forestry.

Forestry 32 will consist of much repetition of subjects taken in Forestry 22, but will investigate them deeper and in more detail. It will give the students more experience with the most important phases of Forestry work, and shall prepare them for a job upon graduation from the school.

INTRODUCTION TO FORESTRY

30 hours

This unit is intended to give students who have decided for the Forestry field an overall picture of this field and a deeper understanding of what it involves:

- Importance of Forestry in Canada. Treat generally on the importance of Forestry in Canada. Main forest regions, wood-using industries.

A. Present distribution of forested areas. The province may be divided into two major regions on the basis of latitude, elevation and location of mountain ranges. Consequently, these regions differ widely in respect to climatic conditions.

B. In each region exist forest types which vary as to species composition, tree size, growth habit, productivity and accessibility.

C. The properties of the wood of the various species are closely related to the utilization of the timber. Value of production and principal products.

References: Native Trees of Canada
Canada: A forest nation. Department of Forestry.
Forest Conservation: Department of Forestry.

Suggested Activities

1. Show on a map of Alberta the main geographic regions.
2. Report on the climate of the various regions.
3. Construct maps to show the distribution of commercial species and forest types.

- Forest Surveys and Inventory: Describe

- Forest Management: General concepts. Utilization of our forests is controlled largely by goverrtment administration, by government and or pricate for management policies and by economic factors.

1. Background. Crown timber in Alberta has been and is being disposed of by many methods.

2. Basic principles of Forestry Management.

3. Timber Sales: Acquiring the right to cut timber.

4. Regulations and authority.
   - Forest Protection: Fire, Insects, Disease, Regulations and Authority
   - Forest Harvesting: The industry. Annual cut by species and division
   - Department of Lands and Forests administrative organization in detail.

References: Management Regulations

Protection Regulations

BOTANY

100 hours

This unit deals mainly with the botany, biology, physiology and ecology of trees and forests.

A. Parts of a tree and their functions.

B. Nature of tree growth. Photosynthesis. Respiration and transpiration.

C. Reproduction in trees. Pollination, fertilization, seed distribution and germination

D. Establishment of the seedling. Life cycle of the tree.

E. The wood of a tree is the result of activity of the cambium layer and consists of cells of various types according to their function.

F. Tree identification. Properties of common softwood and hardwood species.

G. Introduction to plant ecology. Factors of environment affect the life of plants and determine their occurrence to a large extent.

H. Forest associations in Alberta. Silvical characteristics of local species. Typical stand development and stand succession patterns in the important timber types of Alberta.

References

Native Trees of Canada
Botany and the Ranger, A.F.S.
Western White Spruce. A.F.P.A.
Forestry Lessons. Department of Forestry.
Forest Flora of Canada

Suggested Activities

1. Conduct a tour of a forest area to point out tolerance, dominance, growth habits of species, natural thinning.

2. Collect specimens of trees and shrubs and indicate their position in the system of plant classification.

3. Show the film: "Conserve Our Heritage".

MAPPING - 40 hours

This unit is intended to give the students knowledge in interpreting and handling various types and scales of maps issued by the Federal and Provincial Governments and commonly used in Forestry.

A. Interpretation of planimetric maps.

B. Introduction to forest type maps, map reading, forestry symbols

C. Topographic drafting: give students an appreciation of topographic mapping. Reading and interpretation of topographic maps.

References: Alberta Map Index

Suggested Activities:

1. Show samples of planimetric maps and of each type of map issued by the Provincial Government.

2. Have students interpret these maps.

3. Have students recognize in the school forest features shown on the 4" - 1 Mile Map of the forest.

MATHEMATICS -- 40 Hours

This unit is intended to review the specific elements of Math: Arithmetic (fractions, decimals) algebra (formulae) geometry and trigonometry which the students have to master to understand forest surveying and mensuration.

A. Review the fundamentals: fractions, decimals.

B. Lineal, Square and cubic measurements.

C. Simple plane geometry.

D. Properties of Triangles.

Reference: Mathm. Grade X.

Suggested Activities: Exercises under supervision.

ENGLISH AND GENERAL CLERKING - 30 hours

Introduce student to good study habits and correct use of library facilities as well as publications issued by government and industrial agencies, to insure that all technical information is readily available for student use.

A. Business English: Correspondence and forms with emphasis on forms used by government and industry in Forestry. Preparation and writing of business letters and of technical reports.
B. Timekeeping: Time books. Payroll preparation.
C. Commercial paper, duties of camp clerk, daily forms.

Reference: & Suggested Activities: Fill in forms
Prepare payroll
Write business letters
Prepare reports

PLANE SURVEYING AND FOREST MEASUREMENT - 130 Hours

This unit is the most important of the course in Forestry.

A. Dominion Land Survey

B. Traverses using hand compass, 2-chain and trailer tape, Abney level. Magnetic declination. Local magnetic attraction.

C. Care of the instruments.

D. Tables of linear and angle measurements

E. Field measurements followed by construction of maps by scale and protractor.

F. Area. Measurement of areas.

G. Measurement of the individual tree. Estimation of volume in the tree.

H. Measurement of stands of timber. Temporary and permanent sample plots. Fundamentals of timber cruising. Different cruising methods. Temporary sample plot layout for cruising. Cruising with fixed and variable sized plots. Compiling data on cruises. Use of tables. Preparation of timber cruising reports. Tell and show how data will be used and what outcome will be for the management of the timber.

I. Introduction to measurement of timber products. Units of volume. bd. ft., cu. ft., Estimation of bd. ft. and cu. ft. volume in logs.

J. Scaling, by the cord, by the piece, in lineal ft. in bd. ft. and in cu. ft.

K. Lumber tallying.

References

Scaling Instructions. Saw & Peeler logs. A.F.S.
Alberta cubic Scale A.F.S.
Scaling stacked pulpwood. A.F.S.
Cruise and Report procedure. A.F.A.
Standard dimensions and other specifications.
Elementary Plane surveying.
Timber Cruising and Log Scaling. Dilworth.

Suggested Activities

1. Make a traverse in the School Forest using hand compass and 2-chain tape.
2. Travel in the school forest with a hand compass and map.
3. Use and care of instruments used in this work.
4. Plot the field traverse data onto a map. Use of parallel protractor and scale ruler in map construction, using data from field exercises.
5. Use of the dot grid and aereameter in measuring areas.
6. Measure diameter, height and growth of trees on the school forest.
7. Establish permanent sample plots in the school forest and measure growth of the trees in them.
8. Make a systematic plot cruise of the school forest. This involves preparatory office work. Photos, maps, equipment. Field work: Use of cruising prism, calipers, maps, photos. Compilation work: Use of tables; compilation on timber type map. Preparation of timber cruising reports.
9. Scaling: Scale logs in bd. ft. and cu. ft. at the sawmill. Scale plywood logs at an operation near school.
10. Lumber tallying: Tally lumber at the school sawmill.

INTRODUCTION TO LOGGING AND MILLING

130 Hours

This unit is intended to familiarize the students with phase of logging and milling which require an advanced degree of skill. The training period is too short to have the students become skilled loggers and sawyers; nevertheless, it is intended that they be exposed to the right way of doing this work and acquire good work habits.

a. Familiarization with logging. Preparatory work. Location of the millsite, haul roads, skidways and log decks. Felling, bucking, skidding (cat. and truck) decking, loading and hauling.
b. Forest Roads: Road location. Plotting road traverses on map and locating in the field.
c. Familiarization with use of machinery and tools: power saw, trucks, tractors, wheeled skidders, wire rope. Care, conditioning and maintenance of this equipment.
d. Safety practices: Safe use of equipment and machinery. Compensation Board Regulations.
e. Government Regulations: Forest Management and Forest Protection Regulations to be observed in logging.
f. Familiarization with Milling: Sawmill set-up, parts of a sawmill and their functions. Yard set-up, lumber piling and preloading. Sawing of quality lumber.
g. Safe use of mill and yard machinery. Safety guards such as hard hats, boots, goggles, etc.

References Forestry Handbook S.A.F.
Forestry Handbook for B. C.
Forestry Management Regulations - A.F.S.
Forestry Protection Regulations - A.F.S.
Woods Operations Inspection Report A. F. S.
Timber Operator's Manual A. F. S.
Fundamentals of Logging. Allis Chalmers
Logger's Code. Forest Products Accident Prevention Assoc.
The Efficient Sawmill. - Simonds Saw & Steel Co.

Suggested Activities:

1. Students should go through a complete logging show on the school forest. Preparation and planning, operation of the full range of equipment available, by each individual. Some students will be made to enforce government and safety regulations.

2. Students will run through the sawmill logs stacked from previous year, taking turns at running the various equipment in the sawmill and yard.

FOREST PROTECTION

40 Hours

This unit shall expose the students to the various aspects of Forest Protection from Fire, Insects, Disease. Emphasis shall be placed on protection against Fire. This will be mostly theory. Actual Fire Fighting practice will likely occur during the students' summer work with government or industry agencies.

a. Fire: Protection against fire is the first basic objective in Forest Management. Statistics on causes, number, cost and damage by fire to the forest.
Pre-suppression: Hazard reduction, detection, danger index, communications, duties of towerman and standby crews, weather instruments. Preparation of equipment and supplies. Laws and regulations governing protection against fire.
Suppression: Types of fire, fire behaviour, methods of attack, use of equipment. Use and care of fire pump, of firefinder, of portable radios. Communications. Use and care of water bags and hand tools.

b. Forest Insects: Major species peculiar to Alberta. Insect damage and control.

c. Forest diseases: Rots peculiar to White Spruce, Lodgepole Pine, White Aspen and Balsam Poplar.

References: Forest Fire Protection Precis. A. F. S.

Suggested Activities:

1. Set up a weather station including windmeter, max. - min., thermometer, hygrometer, sling psychrometer, rain gauge. Take readings on these instruments at regular intervals, work out a danger index.

2. Visit a lookout tower. Practice in handling the Osborne Firefinder.

3. Use of portable radios. Have a crew locate an imaginary fire on the school forest and call in reinforcements and supplies by radio.

4. Study of insect display.

5. Study of Rod display.

SILVICULTURE

50 hours

This will only be an introduction to silviculture which governs a range of occupations which will take increasing importance in the field of Forestry: Reforestation, Tree Marking, Thinning, Patch Cutting, Controlled Burning.

1. Introduction to and definition of silviculture: Silviculture is that branch of Forestry which deals with the establishment, care and reproduction of timber stands.

2. Silvics, the forest environment. Silvical characteristics of local species, typical stand development patterns, typical stand succession patterns for the area. History of the forest. Notions of Immaturity, Maturity, Overmaturity, Vigor, Thrift, Decadence.

3. Applied Silviculture: Natural and artificial regeneration, intermediate cuts, harvest systems.

4. Introduction to tree marking: Basis for marking. Methods and practice in marking. Marking for thinning, stand improvement, diameter limit cutting, or to eliminate defective trees.

5. Introduction to patch and strip clearcut.

References: Forestry Mgt. Silviculture - A. F. S.
Forestry Mgt. Tree Marking Precis - A. F. S.

Suggested Activities:

1. Field trip in the school forest to discuss forest environment, silvical characteristics of local species,

2. Cone crop survey. Cone collection. nursery.

3. Marking of trees in the school forest in connection with logging work.

4. Lay out a strip or patch for clear cut.

WOODSCRAFT

20 Hours

This unit should give the students ability to live and make themselves at home in the woods, under primitive conditions, as well as handling big crews on highly efficient forestry work.

1. Outfitting: Making up provision and equipment lists.

2. Setting Up Camp: Selection of a camp site, procedure in setting up tent, camp cleanliness.

Suggested Activities

a. Take the students on a 3-4 day outing in the woods to camp under tents and carry out a Forestry work project.

FORESTRY 32

30 hours

Forestry 32 will give the able student a much better forestry background than is possible in Forestry 22. Much repetition will be used to have students understand and remember facets of instruction. The student should have no difficulty in securing employment upon completing the course.

General Forestry

This unit will be a review of the generalities on Forestry considered in the first two years and will give a general background on conservation and Forestry.

1. History of development and practice in Forestry.

2. Conservation: The values of a forest. Renewable resources; soil, forests, water and wildlife, are inter-related and inter-dependent. Encourage liking for conservation. Encourage and suggest to students ways in which they may assist resource management during their lifetime.

3. Philosophy of recreational land use. Ensure students' understanding of concepts on which resources management is based. Emphasize that the purpose of resource management is to benefit people.

4. Administration of Forestry -

   In Canada: Functions of Federal Department of Forestry

   In Alberta: Functions of Provincial Department of Lands and Forests

   Forest Management: Review. Management Units, quotas, sustained yield, Tree Farm Licenses, Woodlots, Acquiring the right to cut timber, regulations, authority.

5. Forest Harvesting: The industry. Value of production, principal products, main centers of industry, present and future, in Alberta.

References: Forest Conservation - Department of Forestry

Suggested Activities:

1. Show films on conservation.

2. Show field example of multiple use: forest, grazing, water and wildlife.

3. Show examples of erosion.

MATHEMATICS

20 Hours

This unit will better prepare the students to handle surveying and forestry inventory problems.

1. Review of fundamentals: Arithmetic, Fractions
   Trigonometry. Measurement of right and oblique triangles.

2. Introduction to principles of sampling as applied to forestry: Means, modes, medians.

3. Construction and balancing of graphs.

References: Mathematics 9. Mathematics 10. Mathematics 20.

Suggested Activities: Exercises.

SURVEYING AND FOREST MEASUREMENT

200 hours

This unit, although basically the same as that taken in Forestry 22, is designed to give the students ability to handle problems with ease and will stress field activities essentially.

a. Traverses using compass, tape and Abney level. Mapping of same. Survey plotting.

b. Levelling. Dumpy level. Abney level.

c. Field type mapping. Notion of contours and relief. Topographic drafting and mapping. Contour mapping.

d. Aerial photography. Stereoscopic viewing. Determining timber types and tree heights. Locating physical features, such as buildings, roads, bridges and streams. Selecting road, fire tower, camp and sawmill locations. Familiarization with use of air photos in cruising.

e. Determination of area.

f. Estimation of volume and growth in the individual tree and stands of timber. Temporary and permanent sample plots for tree growth studies.

g. Cruise reports. Construction of local volume tables. Compilation and mapping of field data. Use of tables for estimating of bd. ft. and cu. ft. volume on a timber area. Cruise summaries.

h. Measurement of timber products. Units of measurement and the application.

i. Utilization. Introduction to forest products made from Alberta tree species. Properties and uses of these products. Degree of utilization. Plywood, Post and Pole, Pulp. Utilization of waste.

References

Aerial Photographs in Forestry - A. F. S.
Photogrammetry and Photo-Interpretation. Spurr
Forestry Handbook of B. C. - U. B. C. Vancouver
Cruise and Report Procedure. A. F. S.

Suggested Activities

1. Supervision of 1st year students on field projects. Traverses, establishment of sample plots, use of instruments.

2. Levelling of major logging road in school forest. Plotting of road on contour map. Interpretation of topography mapping.

3. Photo interpretation with aerial photos of school forest and pocket stereoscope.

4. Mapping of cutover areas.

5. Drafting of cruise reports using field data from timber cruises.

6. Log scaling. Acquisition of Provincial scaling licence.

7. Lumber tallying.

8. Show films of forest products conversion and utilization.

9. Make field trips to conversion plants.

LOGGING AND MILLING

150 Hours

The purpose of this unit is to further familiarize students in logging and milling activities and teach them how to plan these activities and also to supervize small crews.

a. Planning, organization and supervision of logging operations. Cost estimation and control. Location of camp and mill. Setting up a portable mill. Felling, bucking, skidding, decking, loading and hauling, planning, organization and supervision. Volume per acre required for economical cut.

b. Road construction. Location, map layout of logging roads, grading, culverts, and bridges. Forest roads. Standards employed in road construction. Plotting road traverses and profiles.

c. Milling, mill set-up. Mill work experience. Sawing. Mill studies in regard to time, cost, volume and grade recovery. Yard set up. Lumber piling and preloading.

d. Introduction to lumber grading. Lumber marketing.

e. Care, conditioning and safe use of tools and machines.

f. Safety practices. Compensation Board and Forest Service Regulations. Management of small crews.

References: Woods Operations Inspection Reports. A. F. S.
Annual Operating Plans Guide. A. F. S.
Timber Operator's Manual A. F. S.

Suggested Activities

1. Plan the logging of 100,000 fbm of timber from the school forest. Locate roads and mill and camp.

2. Build roads, set up mill and camp.

3. Practice at falling, bucking, skidding, decking and loading.

4. Practice at milling, sawing, edging, trimsaw operator, piling of lumber.

5. Care, conditioning and maintenance of tools and machines.

6. Third year students will supervise activities connected with logging and milling of first and second year students.

SILVICULTURE

150 Hours

This section is intended to give the students a good understanding of a phase of Forestry which will become increasingly important in the future.

a. Review of plant ecology, factors of environment. Silvics. Review of forest associations in Alberta. Review of the life cycle of the tree.

b. Silvical characteristics of local species. Typical stand development and stand succession patterns in the important timber types of Alberta. History of the forest stand.

c. Introduction to forest soils. Development of land forms. Soil composition and structure. Plant nutrition, outline of importance to forest growth. Sites and site quality. Field methods of investigating site.

d. Regeneration. Natural and artificial regeneration. Review of seed distribution and germination. Establishment of seedling. Regeneration survey. Methods of determining regeneration. Tree planting. Planting plans, planting methods, care and handling of planting stock. Scarification and seeding.

e. Cutting systems. Thinnings. Clear cut, strip or patch logging methods. Selection systems with marking. Tree Marking. Basis for marking. Marking methods. Marking for diameter limit cutting, for thinning or to improve stand and eliminate defective trees.

References Forest Management - Silviculture A. F. S.
Tree Marking Instructions - A. F. S.

Suggested Activities

1. Determination in the field of site, environment, forest and plant associations.

2. Survey of regeneration on the school forest.

3. Cone collection on the school forest.

4. Establishment of a small nursery on the school forest.

5. Planning for artificial regeneration on the school forest.

6. Practice in planting, scarification and seeding

7. Practice in tree marking and laying out of a clearcut strip or patch.

WOODSCRAFT

10 hours

A. Outfitting. Personal equipment. Provision and equipment lists. Packing.

B. Setting up camp. Selection of camp site. Camp cleanliness. Procedure in setting up tent.

Suggested Activities

1. Field camp for four days in the spring.

2. Supervision of 1st and 2nd year students camp set-up.

FOREMANSHIP

20 Hours

The purpose of this unit is to familiarize the students with methods and techniques used in successfully handling people and getting a job done with a small crew.

a. Communication: Communication skills development. Stress that one can pass his information to others through meetings, writing of letters, reports. Review of technical English.

b. Line and staff organizations, departmental functions, costs and budgets, purchasing, labor relation, wage and classification administration.

c. Data presentation: Preparation and formal presentation of reports and plans to groups both orally and visually.

d. Investigate techniques included in applying for positions and being interviewed.

e. Economics of the community in relation to the individual.

Date Due

f. Provincial regulations: cutting of timber, trespass, right-of-way, hunting, fishing.

g. Personnel management and safety: Charge of small crews. The worker today may receive the services of many organizations designed to make his working hours more profitable, safer and more comfortable, to give him and his family a greater measure of security in the event of accident, sickness, old age or death.

1. Company personnel department
2. National Insurance (Employment)
3. Unemployment Insurance
4. Workman's Compensation Board
5. Safety organizations
6. Workers' Unions
7. Educational Classes

Responsibility of a foreman, morale, training and instruction, discipline, production, efficience, maintenance of schedules, setting of labor problems, woods camp layout and operation.

References:

The Sale of Timber on Tree Scale in Alberta - A. F. S.
Public Speaking. A. F. S.

Suggested Activities

The students will be asked to prepare a report on a topic concerning the silvicultural or production aspects of woods operations and to present this report to fellow class members.

REVIEW

30 Hours

This unit will consist of briefly reviewing subjects taken in Forestry 22 and not developed in Forestry 32.

a. Fire prevention: Meteorology. Fundamental concepts of climate and climatology. Air masses and fronts. Weather instruments and records. Preparation and use of weather forecasts. Detailed study of fire legislation. Fire camp construction. Radio communication.

b. Insects: Review of insects, damage and control in Alberta.

c. Timekeeping, bookkeeping. Accounting of equipment.

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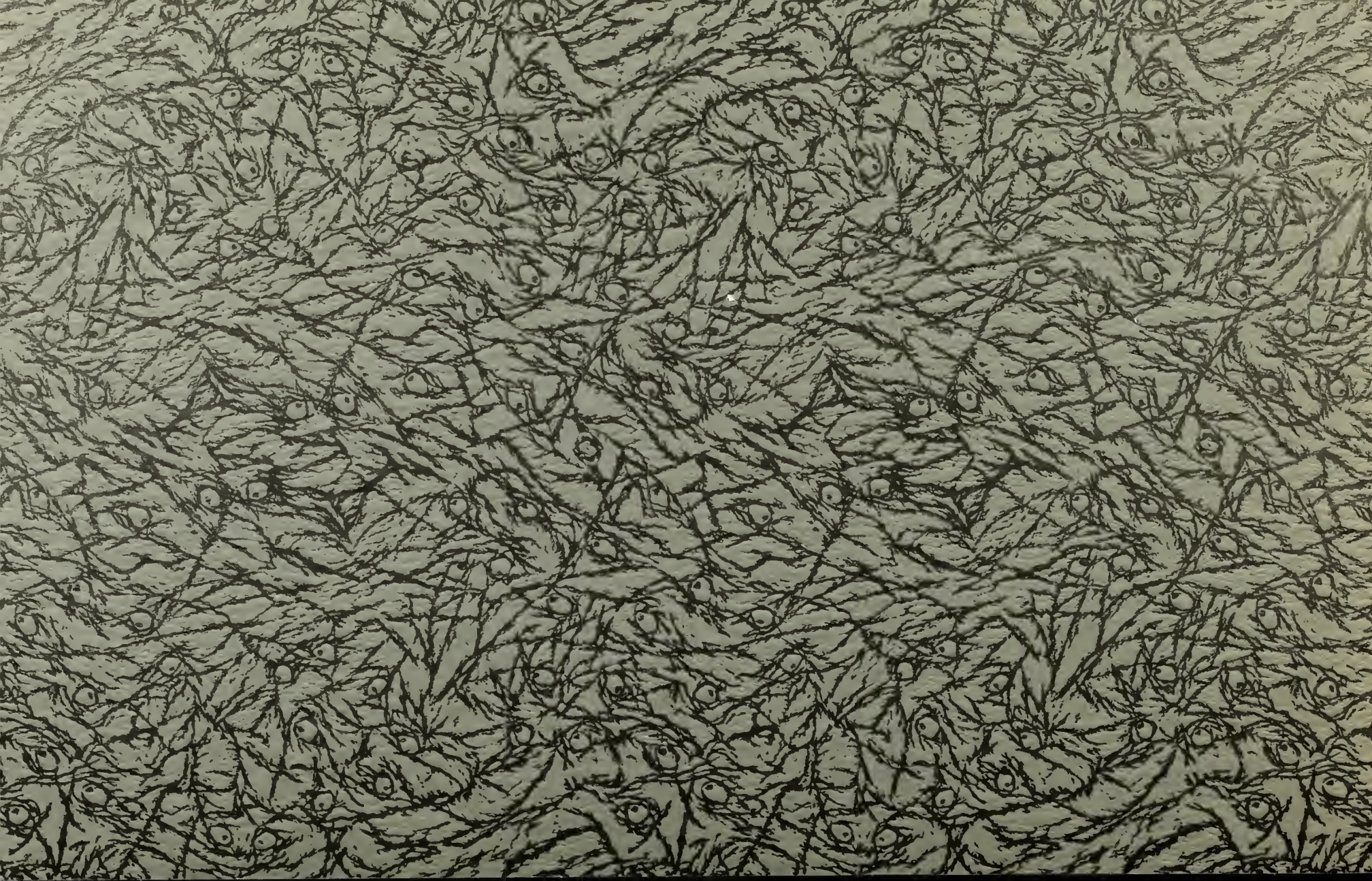
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